

Appl. No. 10/692,174
Suppl. Amdt. dated January 13, 2006

REMARKS/ARGUMENTS

Claims 26, 42, 43, 79, 87, 88, and 93-95 are amended, and claims 1-25, 27-31, 34, 37-40, 44-47, 49-72, and 86 are canceled. Claims 26, 32, 33, 35, 36, 41-43, 48, 73-85, and 87-99 are now pending in the application. Applicants respectfully request entry of this amendment and reexamination and reconsideration of the application.

In the Office Action dated July 1, 2005, claims 26-29, 31-38, 41-43, 48, 54, 57-60, and 66-85 were rejected under 35 USC § 103(a) as obvious in view of US Patent No. 5,810,609 to Faraci et al. ("Faraci") in combination with one or more of US Patent No. 5,653,598 to Grabbe ("Grabbe"), US Patent No. 5,180,482 to Abys et al. ("Abys"), US Patent No. 5,137,456 to Desai et al. ("Desai"), US Patent No. 3,648,355 to Shiba et al. ("Shiba"), and US Patent No. 5,632,631 to Fjelstad ("Fjelstad"). Applicants respectfully traverse these rejections.

Independent claim 26 describes a "test apparatus for testing an electronic device" that comprises "a substrate" and "a plurality of probes." Each probe comprises "a contact tip disposed to make a temporary, pressure based connection with a terminal of said electronic device during testing of said electronic device." Claim 26 also includes "a body disposed at least in part away from said substrate and configured to flex and exert a counter force while said contact tip is pressed against said terminal of said electronic device." The tip thus contacts the electronic device being tested, and the body is spring-like, flexing and providing a counterforce against the device to establish and maintain an electrical connection with the device. To improve their respective functions, the tip comprises substantially palladium or a palladium alloy, which has superior wear characteristics, and the body comprises substantially a spring material to enhance its spring-like function. Independent claim 42 similarly includes a body made substantially of a spring material and a tip made substantially of palladium or a palladium alloy.

Both claims 26 and 42 thus select materials for the various portions of the probe that enhance the primary function of that portion of the probe. Although the prior art patents of record (e.g., Faraci, Grabbe, Abys Desai, Shiba, Fjelstad) mention isolated use of a spring contact structure or isolated use of palladium as a contact material, the prior art of record does not teach or suggest selecting materials for different parts of a probe that enhances performance of the primary function performed by that portion of the probe. For example, although Fjelstad states that its asperities can be made of two materials one of which can be palladium, Fjelstad does not teach or suggest that the other material can or should be a spring material. (Fjelstad col.

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3, lines 46-67.) In fact, Fjelstad does not describe the asperities as spring structures. Likewise, none of Faraci, Grabbe, Abys, Desai, or Shiba teaches or suggests combining a body made substantially of a spring material with a tip made substantially of palladium or a palladium alloy. Consequently, all of the probes disclosed in Faraci, Grabbe, Abys Desai, Shiba, and Fjelstad are inferior to the performance enhanced probe of independent claims 26 and 42. Therefore, Faraci, Grabbe, Abys Desai, Shiba, and, Fjelstad, whether taken individually or in combination, do not teach or suggest the test apparatuses of claims 26 or 42.

Claims 32, 33, 35, 36, 42-43, 48, 73-85, and 87-99 depend from one of claims 26 or 42, and claims 32, 33, 35, 36, 42-43, 48, 73-85, and 87-99 are therefore also patentable over Faraci, Grabbe, Abys Desai, Shiba, and, Fjelstad. Moreover, claims 32, 33, 35, 36, 42-43, 48, 73-85, and 87-99 recite additional features that are not taught or suggested by the prior art of record.

For example, claims 32 and 43 require that the probes comprise substantially a palladium cobalt alloy. Only Abys and Shiba even mention the use of palladium cobalt. Neither Abys nor Shiba, however, teaches or suggests using palladium cobalt in contacts designed for microelectronic circuits like Faraci. Abys' teachings are limited to relatively large electrical connectors, like relay contacts and switches. (Abys col. 1, lines 19-21.) In fact, the palladium cobalt disclosed in Abys is shaped using stamping operations. (Abys col. 2, lines 15-18.) Without question, stamping operations cannot be used in making Faraci's micro contacts 190, 200, which are designed for use with a microelectronic device 265 and must therefore be made using delicate lithographic techniques like those used to form integrated circuits on semiconductor dies. (See Faraci Figures 6A-6E.) Abys' does not explain how or even hint that palladium cobalt could or should be used with microelectronic contacts (like Faraci's) fabricated using delicate semiconductor fabrication techniques. Shiba's teachings regarding electric contact material 10, which is formed by heating and pressing together layers 1, 2, and 3 (Shiba col. 2, lines 1-75), are similarly not applicable to or usable with Faraci's microelectronic contacts 190, 200 and would not lead a person of skill in the field to make Faraci's contacts 190, 200 of palladium cobalt. Thus, it would not have been obvious to combine Abys or Shiba with Faraci, and the rejection of claims 32 and 43 should accordingly be withdrawn.

In lines 46-67 of column 3, Fjelstad makes general reference to the use of "palladium alloys" but never teaches or suggests, or provides any reason to or motivation for, using palladium cobalt. A general reference to palladium alloys does not teach or suggest, and

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therefore cannot render obvious, the use of a specific alloy, like palladium alloy, in a patent claim. Therefore, Fjelstad does not teach or suggest claims 32 or 43.

As another example, new claims 87, 93, and 94 state that the tips of the probes "are disposed to contact terminals of said electronic device having a pitch of less than five mils spacing between adjacent ones of said terminals." None of the prior art of record teaches or suggests probes that are configured to contact terminals with such a tight pitch. Nor is such a pitch a matter of mere design choice. Rather, such a pitch makes the apparatus of claims 86, 87, 93, and 94 suitable for testing small electronic devices, such as unpackaged semiconductor dies. At least because Faraci requires the use of a plurality of contact structures 190, 200 to contact one contact 260 of microelectronic device 265, Faraci's apparatus is not capable of contacting an electronic device with terminals at such a tight pitch. New claims 87, 93, and 94 are thus patentable over Faraci and the other prior art of record.

Claims 89 and 96 state that the tips of the probes are disposed to contact a plurality of terminals of *a plurality of semiconductor dies*, and new claim 90 and 97 state that the "dies compose an unsingulated semiconductor wafer." In contrast, Faraci is design specifically to contact only one microelectronic device, and Faraci is not capable of contacting dies of an unsingulated semiconductor wafer. Claims 89, 90, 96, and 97 are thus patentable over Faraci and the other prior art of record.

Claims 91 and 98 state that the terminals contacted by the probes are bond pads of a semiconductor die, and new claims 92 and 99 state that the terminal is "flat." In contrast, Faraci's contacts 190, 200 are specially designed for spherically shaped ball grid array contacts 260. Faraci's contacts 190, 200 are not capable of making electrical connections with bond pads of a semiconductor die or flat terminals. Claims 91, 92, 98, and 99 are therefore patentable over Faraci and the other prior art of record.

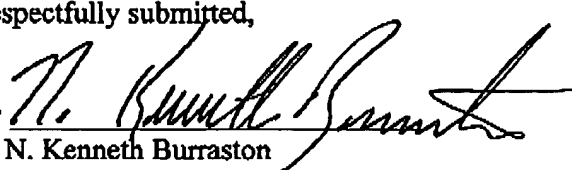
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In view of the foregoing, Applicants submit that all of the claims are allowable and the application is in condition for allowance. If the Examiner believes that a discussion with Applicants' attorney would be helpful, the Examiner is invited to contact the undersigned at (801) 323-5934.

Respectfully submitted,

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